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## THE ARCHITECTURE OF NIPPUR

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NIPPUR at the end of the IV Century B.C. had ceased to be of any importance in the Babylonian world. For upwards of 5,000 years it had been the center of the culture and religious life of the whole nation, but since the advancement of Babylon, 2,200 B.C., its growing power had been slowly robbed of its glory. There was probably a halt in its decay under Cassite rule, but at the time of which I speak it had become merely a collection of mud hovels scattered over its different mounds. Its once crowded Temple was an utter ruin and its gates gaped wide to admit unheeded any who might care to enter into its holy precincts.

However, the glorious City was not so soon to sink into oblivion, for already in a distant land great bodies of a stranger people were preparing to pour triumphantly through the country and eventually the walls of the ancient City were to echo once again with the labors of their countless hands engaged in restoring them to a perfect structure. Not as Nippur the sacred home of the gods, the shrine of the Babylonian Empire, but as Nippur the mighty, the citadel of the Babylonian province, was it to be reborn. Its long history was to have a new era of prosperity, short indeed as compared with the countless ages that it had seen before, but only to end this time because of the total extinction of the whole country and leaving no rival city to triumph over its misfortunes.

This rehabilitation of the ancient City was by a new race with fresh ideas and energies, and in order to understand how they came to exert these upon Nippur we must review the history of the period.

While Nippur was dying of old age, over beyond the waters of the Mediterranean a primitive people, the Greeks, were developing rapidly with the passing years, and soon a time came when they represented all that was great in culture and all that was true and beautiful in the arts. With their wisdom grew their desire for power and territory, so it happened that in the height of their development the conquests of Alexander the Great spread Greek influence over the greater part of Western Asia, implanting the culture and customs of his country wherever he left a garrison. When, in 323 B.C., his death at Babylon resulted in the partition of his empire amongst the most powerful of his generals, we find the smaller kingdoms set up by them continuing these Hellenic notions, naturally including art and architecture, and adapting them to their own more Oriental requirements.

All the region west of the Tigris fell into the hands of the general, Seleucus Nicator, who following out the conquering proclivities of his late imperial master, soon made himself Satrap over the whole of Babylonia. He and his successors held the country for over 70 years until about 250 B.C., when they in turn were pushed aside by the Parthians to make way for their own empire. These latter had been long under the influence of Greece, and if anything, brought with them greater skill in her arts. The Seleucids had doubtless placed garrisons at various points in their kingdoms, erecting fortifications for them, for we find at Nippur some remains of an earlier fortress below the more massive Parthian one. But the Parthians in the full tide of their conquests, dotted the whole country with their powerful defensive works and palaces, the remains of their buildings being found in the upper strata of nearly every Babylonian mound which has been excavated.

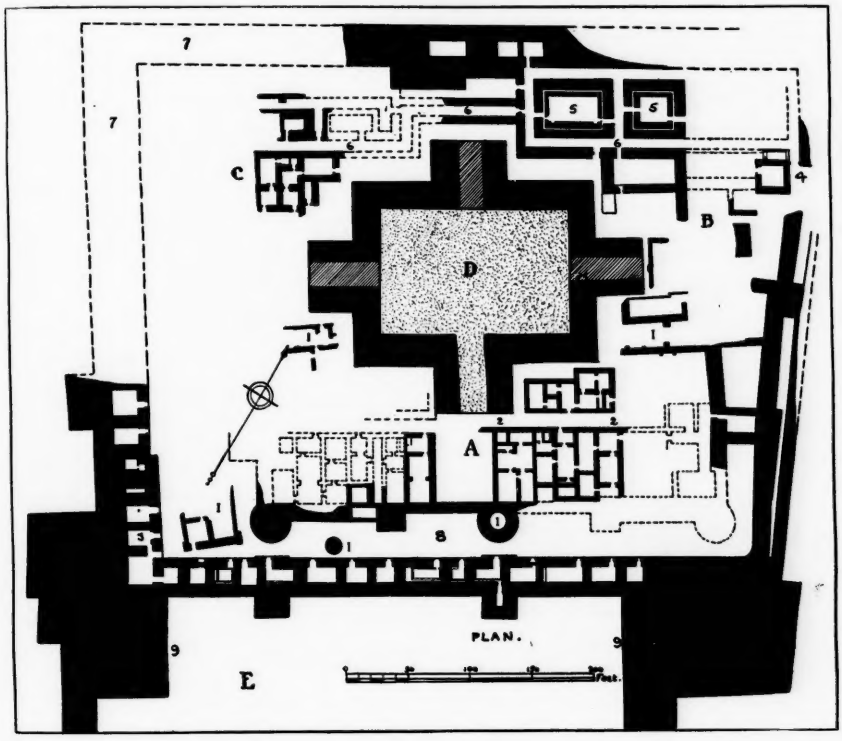
Nippur, situated between the two principal rivers of the country and commanding the great artificial waterway, the Shatt-en-Nil (no doubt at that time still open to navigation), was recognized by them as a most important strategic point, and so they proceeded to erect upon its site the fortress, which so far as is known is unequaled in Babylonia. As I have said there are remains of a probable Seleucidan building of similar construction and with the same kind of round towers as were used in the latter structure, some 6 to 8 feet below the Parthian fortress and at an angle of 8° 10′ with it, but this earlier building is a pigmy compared to the one built over it, and we can therefore give to the Parthians the whole credit for the masterpiece which made a fitting close to the varied architectural history of Nippur.

Before entering upon a description of the architectural results obtained at Nippur, it is necessary to state the amount of material available prior to the closing months of the last campaign in 1900.

When I was preparing to go to Nippur in 1898, I naturally made diligent search for all previously published records. The result was most disappointing.

As the first campaign [1889-1890] lasted a little over 2 months, and was largely tentative in character, we could naturally expect from it little in the way of architectural information. The second [1890-1891] lasted a month longer than the first and should have been more productive of architectural results. Of the third [1893-1896] we have fortunately some few carefully measured diagrams by Meyer, but no scientific data. The same can

be said of the first part of the fourth campaign [1898-1900]. Even after the arrival of the architects in the fall of 1899, only fragmentary plans could be made, owing to the bewildering array of tunnels and trenches, everywhere cutting through walls and pavements, and other circumstances. When, however, Professor Hilprecht arrived on the site, March 1, 1900, his remarkable archæological skill and untiring energy infused order and method into the work, and from this time must date the beginning of the great architectural results which have been achieved. That they are not more numerous in details must be attributed to the facts just mentioned.




THE PARTHIAN FORTRESS [C. 200 B.C.] BUILT OVER THE RUINS OF THE TEMPLE OF BÊL [FIG. 1*]

## THE PARTHIAN FORTRESS

It was the imposing masses of this fortress which led the earlier excavators of the site to suppose that they had found the Temple of Bêl itself, although on every hand were the proofs of the un-Babylonian character of the building; fragments of Greek pottery, lamps, figurines, etc., and the great round defensive towers never found in any purely Babylonian structure. Owing to the large quantities of débris which have been placed on several of the most important parts of the building, we are not able to present a complete picture of this fortress. What we have been able to obtain is shown in the above plan, Figure 1.

Of the original 3 divisions of the fortress, only the inner court and the citadel have been excavated sufficiently to obtain data for a restoration, while the outer court has only been touched upon by the first 2 expeditions and no measured plans of their work are at hand. We can only say that such an outer court [E] did extend towards the south, for we have its enclosing walls extending in that direction, with the bastions 9,9 which defended their junctions with the main wall. Our description will deal only with the inner court and the citadel.

This was an irregular quadrilateral 478 feet long on the S.E. side and 385 feet wide. With the added thicknesses of its enclosing walls it reached a length over all of nearly 560 feet. It was surrounded by a massive wall 40 feet thick at the base and 30 feet at the level of the rooms along its top, 25 feet 6 inches above. At no point was it entirely intact. On the S.E. or principal side 33 feet 8 inches remained of it, and at several other places it reached a height considerably more than this. Like the rest of the building it was composed of unbaked bricks in the shape of truncated pyramids 12 inches square on their largest base and 9 inches thick. These were always placed with their large base upwards and laid in mud mortar. In order to better protect it against the ravages of rain it had an underpinning of baked bricks 1 foot 5 inches deep, running under the wall 5 feet 3 inches. At the E. and S. corners, where I have said the walls of the outer court joined it, were great bastions with several angles, so that the arches on the top could have better opportunity of checking the assailants of the place. Between these two bastions were a couple of square buttresses or towers projecting 17 feet 8 inches and 28 feet and 4 inches wide, facing the outer court, and thus commanding it as well as defending the inner court if the outer one was taken. On the S.W. side, where the wall reached a thickness of 60 feet, there is another similar tower, and doubtless there were others placed at intervals all around the wall. Along the top of the S.E. and S.W. walls as far as excavated we found a series of small chambers opening inwards on to the narrow space [8] which separated the outer and inner walls. Numerous slipper coffins of the latest type were found in these rooms, sometimes below the level of the floor and again partly in the wall which had been cut away to admit of their burial. No positive evidence was discovered of the use to which these rooms were put, but they no doubt served as quarters for the garrison, particularly those upon whom the defense of the wall devolved. On the N.E. wall we can see how the wall was constructed. Instead of making it one homogeneous mass of crude brick, the builders saved in material and obtained just as strong a wall, by making two casings of brick and filling the space between with tufa or clay which has been partly mixed but not molded into bricks. At several points cross walls tied the two casings together. No doubt rooms occupied the top of this wall as well, or at least a portion of it.

Parallel to the S.E. wall and 25 feet inside it at the narrowest point ran the inner wall of the fortress [8]. This formed the wall of the numerous buildings contained in the inner court, and really was the most important part of the whole defensive arrangements, excepting the citadel. It, like the heavier wall outside, was protected by numerous towers. On its S.E. face it had 3 round towers, one at each end and one in the center. Of these only the central and S. towers remain, and they are fine pieces of construction, 38 feet thick, and protected by an underpinning the same as used on the other wall. The central tower has as a core the remains of the smaller

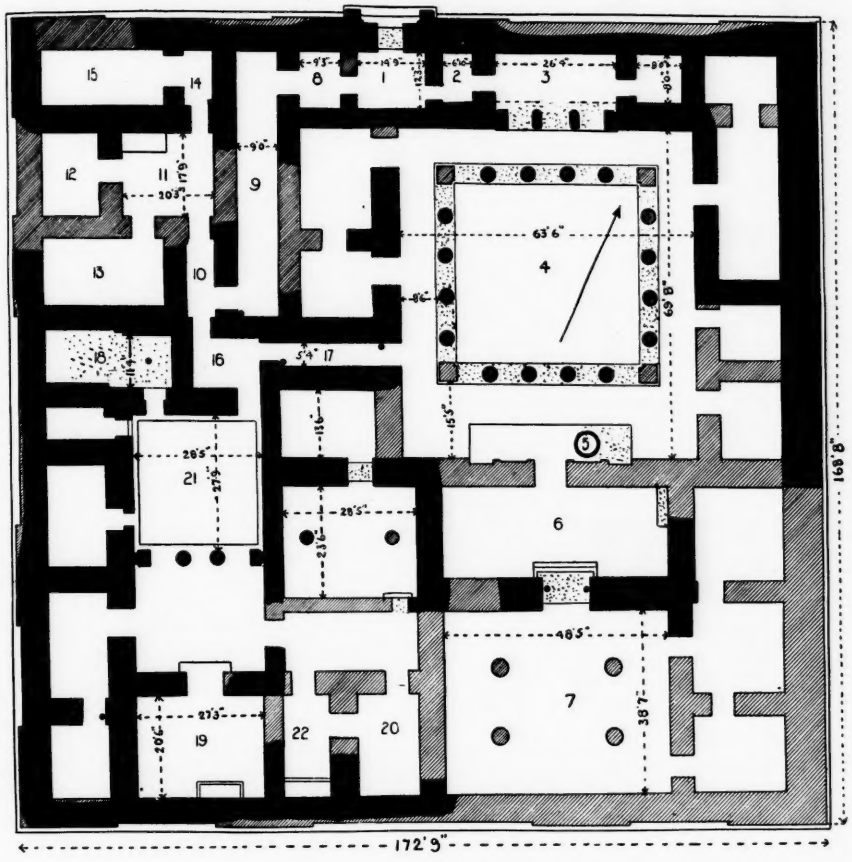
Seleucidan tower which, as it lay in the line of the new wall, was incorporated with it. Its companion was left standing in the space between the walls. Between the round towers were two others 23 feet square. This wall did not seem to surround the entire inner court, as we find the rooms at the rear of the citadel D [5,5] built right against the great wall, and on the N.E. several large irregular rooms are built in the same way, so that there is no intervening space between the two defenses. At no point has any entrance to the fortress been found. The old entrances of the various temple periods lay directly under the central round tower of the inner wall, but the Parthians abandoned this position and changed it to one of the other sides of the place. As the angle towards the W. [7] has been totally ruined by the rains and a resulting landslip, we can never discover any traces in that direction. As the gate does not exist on the S.E. side, this leaves us only the North corner and the ruined West corner as possible sites for it. Now from the general construction of the inner court everything favors the North corner as the main entrance. Let us study the grouping of the various rooms that we may understand why this is so. The whole S.E. side of the fortress A (*i.e.* all that portion lying between the inner wall and the citadel) is filled with a great number of small unimportant rooms which we can at once put down as being used for the barracks, the storehouses, the kitchens and all the varied uses of a large garrison. In many of them "great masses of water jars were piled together" and in others "fireplaces and other arrangements," together with lamps and pots of all shapes and sizes prove this. A street 11 feet wide ran through this general quarter and served to separate it from the more private part to the rear. This section B was much more elaborately and spaciously planned, and we can again say that this was surely the palace or state section of the edifice. Two large halls [5,5], one 21 feet by 41 feet, and the other, 21 feet by 22 feet 6 inches, entirely surrounded by the corridor [6] were undoubtedly the principal reception rooms of the governor of the fortress. They were protected from the intense heat of summer by an air space 18 inches wide in the wall between the corridor and the rooms, while their walls were made thicker than in the rest of the rooms for the same reason. Everything shows that they were intended to be the select parts of the place. Now the corridor [6] following round the rear wing of the citadel leads to another series of rooms which, though not so fine as those we have just noted, are much superior to the barracks on the S.E. We can claim, therefore, that these being so intimately connected with the reception halls, yet so carefully guarded from intrusion, can be no other than the private rooms of the palace, or as it is called in the modern Oriental home, the Harem. Hence it could not be possible for the main entrance to be placed so near to the inner apartments and so far from the public reception rooms. The northern angle would fulfill all the conditions required for such an entrance. We have found here a small door [4] with its jambs of baked brick, and while it is very small for such an imposing palace and opens out on the wall must have served at least as one of the entrances to the building. A portion of this corner remains uncovered, and when we are able to remove the dump heaps which interfere with our work at this point, we will no doubt be able to definitely locate the entrance and fully trace the outline of the outer wall.

From the midst of this complex of rooms and passages rises the great citadel D. It most naturally was built over the remains of the ancient Ziggurrat of the Temple, as the builders found ready to their hands a mass of

baked and unbaked brick of a shape which made it easily conform to their requirements. The last Ziggurrat, that of Assur-bani-pal, was 128 by 190 feet, with its four sides faced with baked brick. This the Parthians altered into a defensible citadel by the addition of several extra feet of covering and four arms extending out perpendicularly to the sides a distance of 30 to 50 feet. These, as in the case of the wall towers, gave the occupants a command over the whole of the different quarters of the fortress beneath and made the repulse of any party attempting to scale the walls of the citadel itself more easy. The great importance attached to this part is shown by the care exercised in its construction. Although it was a solid mass of crude brick laid over the earlier ruins, its faces were protected by a covering of baked brick some 2 feet thick [Fig. 2], the material for which was taken from the old temple below it. We may consider the citadel as being built in two stages, the lowest with the projecting wings about 30 feet high, and the second, smaller in size, so as to allow of a wide terrace all around it, about 20 feet more. It is also more than probable that there was a small group of rooms above this, *i.e.*, on the second platform, for since the citadel would be a place of final resort, to which all the surviving defenders would retreat, it would naturally be supplied with living accommodations, not only as a protection against the weather, but also against the missiles of the besiegers. However, no faces of the second stage or traces of any buildings on top were discovered, our height for the second platform being based approximately on the amount of débris which remains above the first stage. Another evidence of the precautions taken is the well sunk down through the solid mass of brickwork of the previous temples to the water level. An immense amount of time and labor must have been expended upon this, and it was worth it, for in case of the worst happening, the taking of the inner fortress, the defenders could still hold out for some time by its aid. The approach to it lay probably at the north angle, where the character of the lower stage was different from the other three corners, but from the records left us we cannot definitely settle the point.

### THE LITTLE PARTHIAN PALACE

Although situated on the opposite side of the Shatt-en-Nil, in what was during the ancient days the business section of Nippur, I treat of the little Parthian palace after the great fortress, because it belongs to the same period and had the same builders. Similar great blocks of crude clay are used and many of the general characteristics of strata, burials, etc., are the same. It was first discovered by the expedition in 1889, but only the central court was exposed with a few adjoining rooms, which, however, had never been correctly measured or drawn. The third campaign cleaned out the débris which had accumulated in the previous excavations, but did no further work on the building itself. After the arrival of Professor Hilprecht in 1900 the clearing of this portion of the site was undertaken with energy and our labors were rewarded with the almost complete plan of this beautiful palace [Fig. 3]. What little was missing was easily restored from the fragments of jambs, etc., which remained. At the West angle the rooms 9,11,12 were nearly destroyed by a careless trench driven right through them during the first campaign, but by digging systematically we were able to obtain traces of the walls on both sides. So too on the East angle. Here, Dr. Peters states [*Nippur*, vol. II, p. 182], "everything was washed away, and it was impossible to obtain any clue for a reconstruction of the building on this



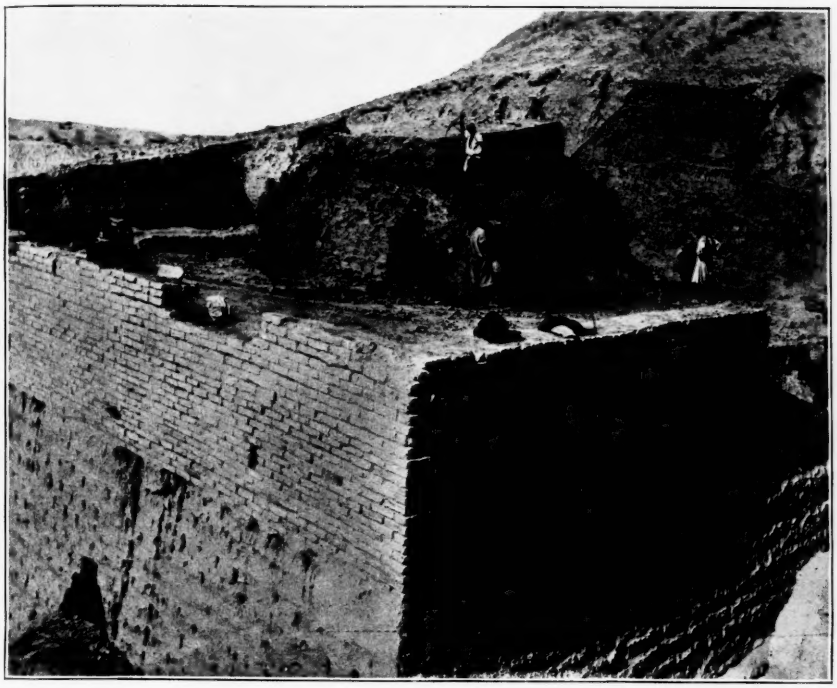

LITTLE PARTHIAN PALACE [FIG. 3]

side." He was so sure of this that he placed a dump heap on the spot, and we were again, shall I say more fortunate in finding beneath it not only fragments of the walls that existed here, but the doorway of the great hall of the palace itself, with its little flight of steps, its 2 door-sockets in place, and numerous fragments of the iron nails and bolts which had been part of the wooden doors. With the exception of these two gaps the building was nearly complete and, as I say, the restoration was a comparatively simple matter. The following are the main features of this fascinating building.

We may consider it as being built in the form of a square 170 feet on a side, although here, as in most of the ruins, the builders were unable to lay out their work accurately on a large scale, for each of the 4 sides differs, the longest, the N.W., being 174 feet, and the shortest, the N.E., only 168 feet 8 inches. The main façade was towards the N.W., and here was a very elaborate entrance, whose details give us the first evidence of the Hellenic character of the building. Three broad steps led up to the door. The lowest of these, by returning against the wall, forms a plinth for the

whole feature to rest upon. At either side were pedestals, a little over 4 feet high, with base and cap mouldings. Although they were made up of common brick cut to shape, the beautiful curves display by their refinement if not a special training in Hellenic art, at least an intelligent copying of their Greek prototypes. The pedestal had not a straight face, but a delicate curve outwards from the base, so that the top projected a few inches beyond it. The whole was plastered with white lime mortar, carefully smoothed off. These pedestals evidently supported fluted pilasters, for we found traces of flutes on one side, but badly broken. On top of the pedestals were also small ornamental pediments of brick.

We enter a small vestibule 1 [see Fig. 3] from which open 2 doors, that to our left hand leading to the men's or public section and that to the right to the women's part. We will deal with the men's quarter first, as it is not only the largest part of the house, but the more ornamental as well. After passing through an anteroom [2] we reach the loggia [3], opening on the great courtyard [4], from which it is separated by 2 columns in antæ, of baked brick covered with stucco. These are not round columns, but rather two half columns built on either side of a square shaft. As they were placed in the line of a main wall the object of this construction is very evident. The main court, a means of lighting and airing the surrounding apartments, was 63½ feet by 69 feet 8 inches in size. Its center was open to the sky and a covered colonnade surrounding it, 8½ feet wide, connected all the rooms of this quarter. Twelve only of the columns out of the original 16 which formed the colonnade were in place, for the 4 on the East side as well as all of the four square piers at the corners were traceable only by slight indications of their bases. The columns had a diameter at the base of 2 feet 9½ inches, and from the one which lay prostrate we know that they were at least 12½ feet high. These, as well as all the columns and antæ in the building were of baked brick plastered. On the East side a few fragments of a capital were found. Here again the builders had tried to adapt the material of the country to the forms they were used to seeing. These fragments cut to radius had the shape of the Greek echinus and fillets, so that reconstructed they give us a pure, if somewhat crude copy of the Doric capital. That they were not so successful in their attempt with these as with the entrance mouldings we may put down to the fact that they had to construct from 12-inch bricks a capital to crown a column over 2 feet wide at its top, and not a straight moulding as in the former case. On the South side the colonnade widened out to 15 feet 5 inches, to make a more effectual entrance to the principal hall. Here on a broad step before the door stood a round altar [5], a thing never missing from the true Hellenic court. This was mistaken for the base of a huge column by the first expedition, but the absence of another on the opposite side would preclude this idea, even if we had not the evidence of its size and position. The space between this step and altar was cut up by a deep trench, so that we could determine nothing of the character of the pavement or wall. It is easy to suppose, however, that this was occupied by the vestibule [6] of the Megaron or men's hall, for at its southern end was the doorway we have already mentioned. Three low steps led up to it and the door sockets at each side show it to have been a double door. Fragments of the hardware were scattered around. The hall [7] into which this gave admittance was by far the largest in the palace, 38 feet 7 inches by 48 feet 5 inches in size. Only the entrance remains to us, but its dimensions, which we can restore, would lead us to suppose that



S.E. WING OF ZIGGURRAT, SHOWING BRICK FACING [FIG. 3]

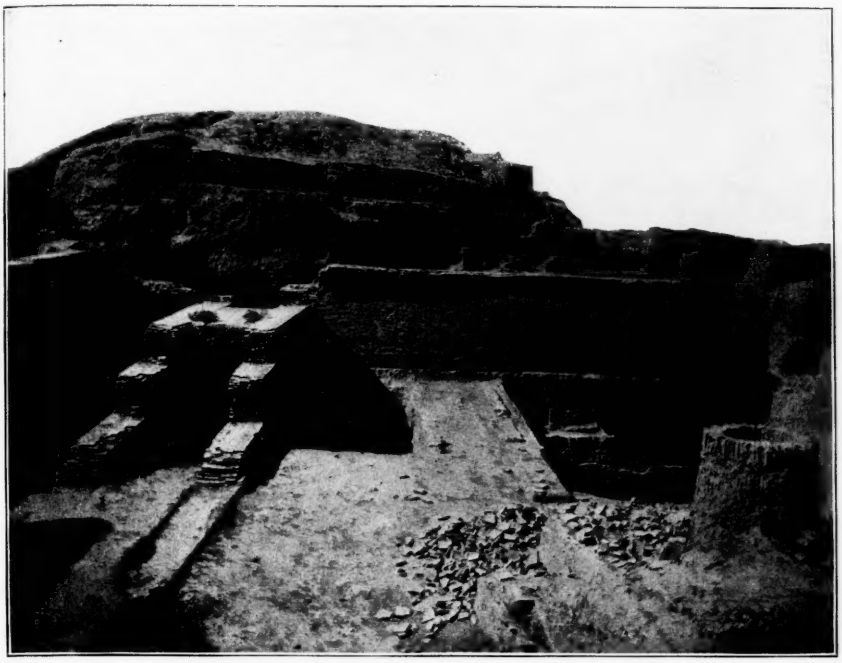
COURT OF LITTLE PARTHIAN PALACE FROM MEN'S HALL [FIG. 4]

it had columns to support its roof, in which case it doubtless had a raised skylight after the fashion of the palace at Tiryns and other Hellenic ruins which have come down to us. Beneath this would have been the low hearth usual in the men's hall. Fig. 4 gives us the view from this room through the door out into the great court.

The various rooms around the court and those opening off the Megaron were used as sleeping apartments or for storage. As all this part of the house was public, we find it very carefully shut off from the rest of the building. Besides the entrance at 1, we have only the narrow passage 17, guarded by a strong door at either end, connecting with the more private, or Harem section. We will now consider the details of this secluded portion. When we entered the vestibule 1, we turned to the left to reach the men's apartments. Turning now to the right in the same room, we have to pass through another small room [8] similar to that on the other side [2], into a long corridor 9. At the far end of this is a little room [10] with 1 door opening to the servants' quarters and another to a vestibule or anteroom [16], into which latter the passage from the men's court [17] also leads. We now enter the women's court [21]. The arrangement is similar to that on the men's side, but on a smaller scale. The court is but 27 feet 9 inches by 28 feet 5 inches, and lacks the beautiful colonnade. We have, however, a deep porch on the South side serving as a screen to the women's hall [19]. This porch or loggia is divided from the court by 2 round columns in antæ. A single step leads to the door of the lesser hall, an insignificant room compared to the fine one in the other section. The room to the east of the smaller court with its two columns, is even slightly larger and may have been the chamber of the lordly owner himself. One of the most interesting rooms of the palace lay on this side. In the upper corner of the women's court a small door leads into a complete bathroom, 11 feet 4 inches wide by 27 feet 3 inches long. The floor is laid with baked bricks set in bitumen and covered with a layer of the same material. It was graded carefully to a point opposite the door where a deep vertical drain was placed to receive the water. A row of tiles around the edge of the room kept the splashing water from damaging the unbaked brick of the walls.

We mentioned above a door opening off room 10 leading to the servants' quarters. These we identified as such by their being isolated from the rest of the rooms and being with one exception all small. This exception [11] had a great interest for us, as it illustrates very well the risks as well as the inaccuracy of the promiscuous trench system. It was one of the rooms partially destroyed in 1889, but strange to say the chief feature of it was left untouched. This was a perfect hearth built of brick and with a stone spit all complete, situated in one corner. Beside it were two water jars, part of the equipment of the cook, who seems to have abandoned everything in a hurry. Perhaps we can see a reason for this in the traces all over the palace, of the conflagration which had destroyed it.

The building must have presented a very plain appearance from the outside, as besides the door there were no other openings, for they would naturally light and ventilate their rooms from the two courts and the kitchen, probably also open to the sky. On three of the sides we have traces of paneling, showing that on these sides at least there were open spaces. On the N.E. the wall has a different character, not only being thicker, but utterly devoid of any ornamentation. Outside this were traces of walls, and it is likely that another building adjoined it on this side.



THE ZIGGURRAT AND ITS APPROACH, TEMPLE OF BÊL [FIG. 6]

TEMPLE GATE BELOW PARTHIAN TOWERS [FIG. 8*]

On the floor of the large court and in several of the rooms were found some of the ashes of what had evidently been the roof of the building. The customs of the country have altered so little since the days of the Parthian palace that I can consider that the method of roofing employed on it was similar to that in use to-day. The process is simple. Palm logs are laid across the open spaces and coarse straw mats are spread upon them. Brushwood or straw is now laid over the mats to a depth of a foot or more and then mud is placed upon the roof and rolled or stamped down hard. Sometimes a coating of bitumen is spread over the mud to render the roof more permanent and waterproof.

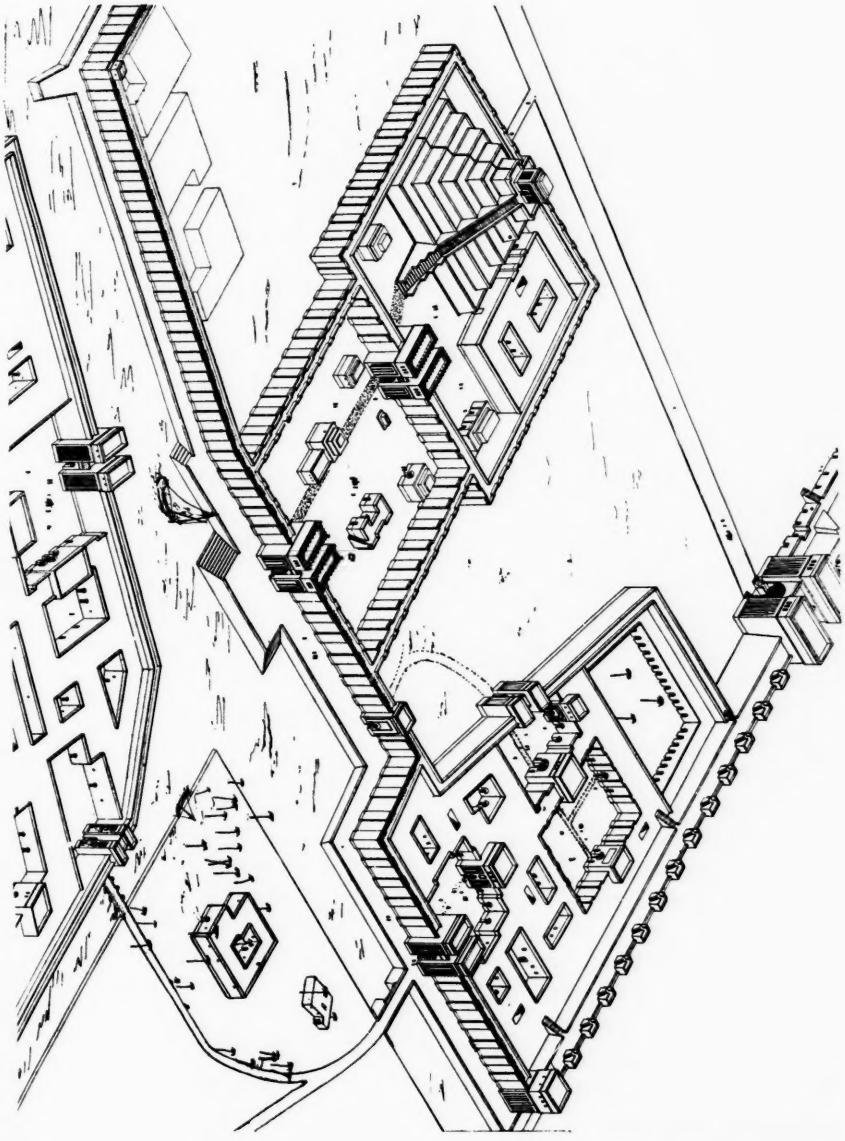
Fig. 5 gives a section through the entrance vestibule, the great court and the men's hall, showing their relation to each other and the system of roofing as restored on the principles described above. It also shows the arrangement for admitting light to the great hall, based, as I have said before, on the Megaron at Tiryns and elsewhere.

### THE TEMPLE OF BÊL

Returning to the other side of the Shatt-en-Nil, we will now consider the structures below the Parthian fortress. Immediately under it are the fragmentary traces of the Seleucidan fortress with which we need not at present concern ourselves. They are indicated by I on Fig. 1. The next in importance is the last reconstruction of the great Temple of Bêl, by Assur-bani-pal about 650 B.C. The Ziggurrat has always been the point where most of the excavating has been done, but owing to its enormous bulk little of it has been removed. To study fully the intricate problems which this huge stage-tower presents, it will be necessary to carefully peel away its several layers, one after the other. It has been supposed that the mass as it stands was entirely the work of Ur-Gur, and that his Ziggurrat was the first as well as the last to be used at Nippur, only being faced or restored by later rulers. Professor Hilprecht in a few weeks was able to demonstrate that this theory was entirely erroneous, and that while Ur-Gur certainly did reconstruct almost the entire Ziggurrat, he merely followed on the lines laid down by builders ages before his time. Both inside his work and below it are the remains of much older stage-towers.

When Assur-bani-pal came to rebuild the temple, he found the sides of its Ziggurrat, or at least its front, faced with baked brick. This he left as it was, merely patching it where necessary. The other 3 sides, perhaps badly ruined or only of unbaked brick, he covered with a new paneled facing [Fig. 7], carrying out the same details of watercourses, etc., which existed in the previous building. He relaid a pavement over the whole courtyard and very likely rebuilt the temple wall itself, although all traces of this have disappeared [Fig. 6].

At the varying depths below his pavement are the pavements of earlier Temple builders. Kadashman-Turgu is 2 feet below, Ur-Ninib 4½ feet, Ur-Gur 6½ feet, while 14½ feet below is the splendid double pavement of Naram-Sin, 3,750 B.C. We have some of the building operations of each of these men, but no complete structure of any one of them, nor even any record of parts of their work which have been removed. Here again Prof. Hilprecht has demonstrated his archæological skill and gathered together many of the scattered fragments and for the first time enabled us to obtain a true and conclusive idea of the structure and uses of a Babylonian temple.



In the above plan I have embodied the results of Professor Hilprecht's strenuous labors and studies on this site, and this will serve to give us our first true impression of the great Temple of Bêl as it existed in the last III Millenniums of its history, with its relation to the library in the foreground, the patesi's or high priest's palace on the right (unexcavated), and the great city gate in the background.

We have the position and character of the Ziggurrat and also the walls of the Temple proper as well as its principal gate. This latter was really uncovered some years ago, but strangely enough it was not then known what it was. Fig. 8 shows how it was situated below one of the round towers of the Parthian fortress. The importance of its paneled faces was not realized, and so it remained incomplete while the search for the Temple gate went on in various other parts of the court. During the latter end of the last campaign we were fortunate enough to be able to remove the mass of the late tower above and found outside the 2 sides similar to that within. The side opposite to the one in the photograph was destroyed by a vertical shaft cut by one of the early expeditions, but the other 3 perfect sides left us with no doubts as to the shape and purposes of the structure. The uncovering of this led to even more important results, for having previously found part of a paneled wall to the east of the gate, we followed it up and proved its connection with it. We then continued it to the west uncovering it completely. At each end we found that the wall turned at a right angle towards the southeast, and these walls were traced a sufficient distance to show that they represented the enclosing walls of an outer courtyard of the Temple.

What a different picture of the great Temple of Bêl to what we have been previously led to imagine. [Compare Fig. 9 and Fig. 2.] The real Temple of Bêl was divided into two courts. [Fig. 9.] B, the outer one, was for the general public, and contained the shrines of Bêl and other divinities then in vogue, and was about 260 feet square. The gate [Fig. 8] connected it with the inner court. This is quite similar to those found at Nineveh, but somewhat smaller, while its age is far greater, before the reign of Ur-Gur, 3,000 B.C. The passage through it was only 6 feet wide, but at each end it was increased by a series of stepped recesses to a space 14 feet in width. We can suppose that these formed an ornamental jamb to the arched entrance. On both sides rose the great masses of the towers or pylons which gave the gate its imposing appearance. Both the front and inner faces were paneled, as was the whole outer surface of the wall. The depth of the gate was about 52 feet and its width on the outer face was the same. Halfway through its narrow passage were two guard chambers, one on each side. No socket was found *in situ* belonging to this period, but one in a strata above of the time of Assur-bani-pal, having the same relative position to the gate of its own period, would lead us to believe that the older gate swung in the direction of the vault to the east.

The inner court [A] was undoubtedly used exclusively for those intimately connected with the religious observances of the Temple, and the general public could come no further than the outer court. On entering the mass of the Ziggurrat rose immediately in front. Its lower stage was 128 feet by 190 feet and about 20 feet in height. The second stage was set back 8 feet on its three principal sides and about half as much at the rear. In fact, the whole stage-tower was placed very close to the rear wall, leaving hardly room for the smaller gateway which was found there. There were probably only 5 stages to the Nippur Ziggurrat, the height of each decreasing in a more or less regular ratio. On the summit was a small shrine, to which access was gained by the long flight of steps which, starting near the entrance gate, ran unbrokenly to the uppermost stage.

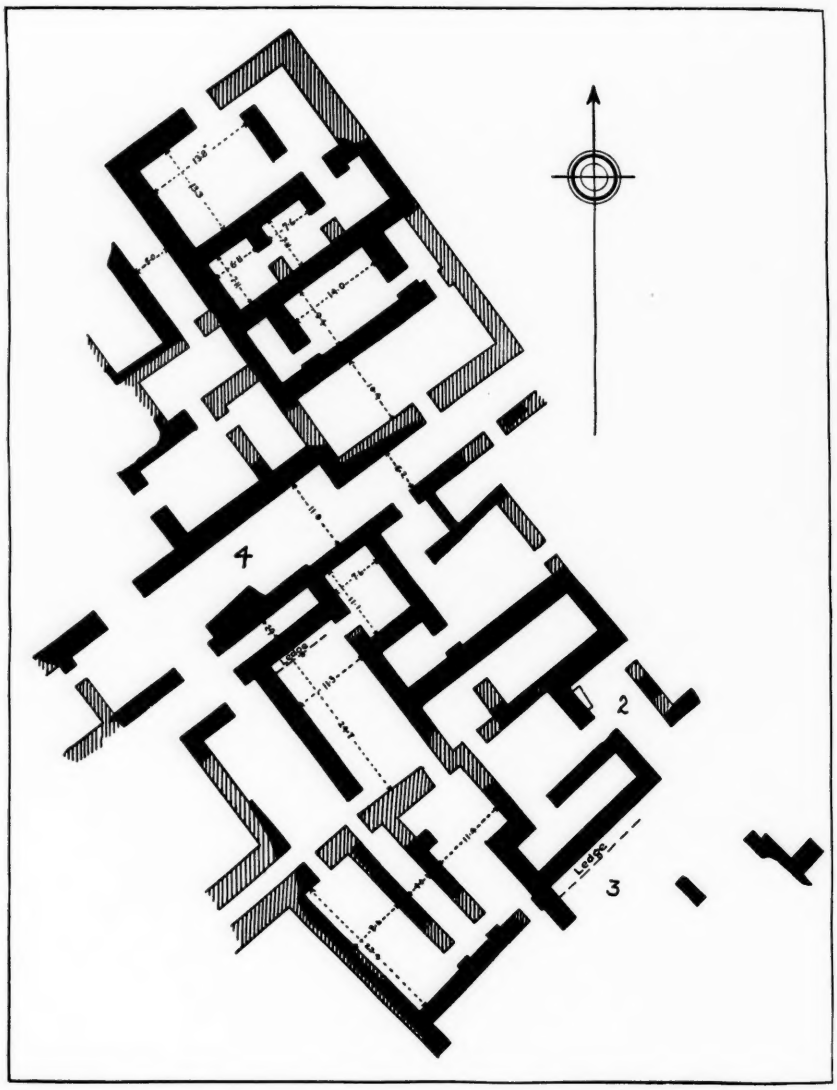
On the right a long paneled wall, pierced with 2 doors, marked the site of the temple proper, and south of it was a smaller building whose purposes

RUINS OF TEMPLE LIBRARY [FIG. 11]

are at present undetermined, owing to the small fragment remaining. Our data on this part of the Temple are scanty, owing on the one hand to the valuable pavements and walls which have been removed, and on the other to the enormous dump heaps which render it absolutely impossible at present to get at the walls beneath them. Our picture of the Temple must remain for the present incomplete as regards smaller details, but the general arrangement of the Ziggurrat, with its gates and walls are determined. [See plan on p. 111.]

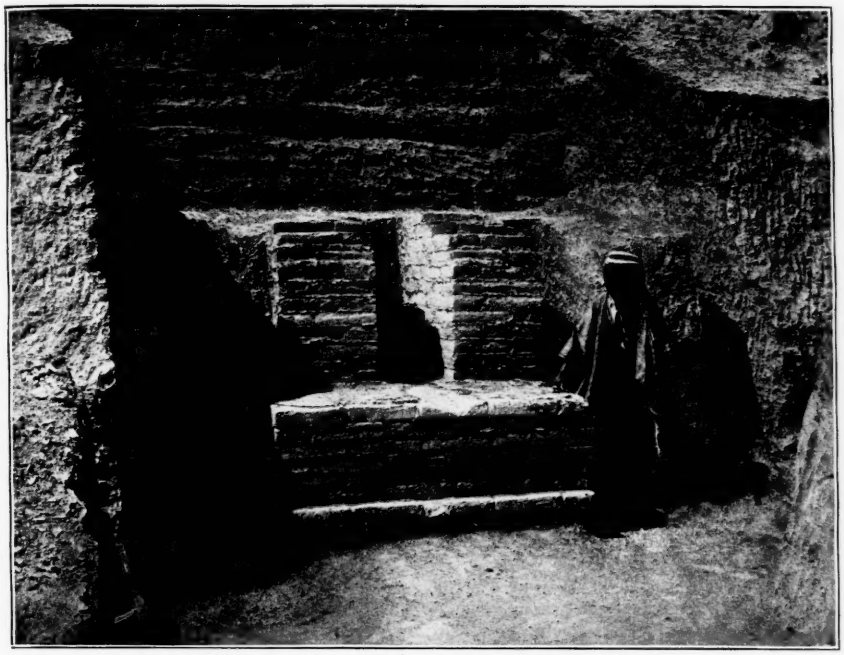
## THE TEMPLE LIBRARY

The Temple Library was situated to the south of the outer Temple court and was separated from it by a branch of the Shatt-en-Nil. It does not seem to have been included in the Temple wall, but occupied an independent position. Only about $^1/_{12}$ of its entire area has been uncovered. I give a plan of the portion nearest the Temple [Fig. 10]. Owing to its extreme age it was very difficult to distinguish its ruined walls from the débris around and above them, and in many instances the unbaked brick and the débris from the roof and walls above had formed a homogeneous mass. The rooms are irregularly arranged, and from the small portion open seem to have been arranged in no definite system. To the north, however, there is a complete suite of rooms apparently separated from the library portion (*i.e.*, where the most tablets were found) by a corridor or street 4. In the rooms marked 1, 2 and 3 were narrow ledges on which were lying masses of tablets, as they had been thrown by the falling in of the roof and walls.




PORTION OF TEMPLE LIBRARY [FIG. 10*]

As there were any quantity of them piled together, it would seem that there had been several shelves or ledges one above the other, and that their contents had been precipitated onto the bottom shelf by the collapse of the building. In Fig. 11 the general appearance of the library is shown, after it had been excavated. At the right near the number of the photograph is seen the ledge which in the previous plan is numbered 3. The badly ruined condition of the place is also admirably shown.



DORIAN IN CITY WALL OF NARAM-SIN, 3,750 B.C. [FIG. 13]

## THE CITY WALL AND GATE

To the N.E. of the temple was the Abullu Rabu, or great gate of the city. Opposite page 54 [RECORDS OF THE PAST, Vol. II, 24] is a photograph of the existing fragments of this gate. Only one side is complete, but a portion of the foundation of the other side enables us to definitely ascertain its position. Its length was 35 feet, which would represent the thickness of the wall at this point, although no traces of the wall itself remain, the unbaked bricks of which it was composed being removed for a distance of 360 feet by the later builders of Nippur, most likely the Parthians. They required an immense amount of material for their huge fortress and made use of the old outlying city walls, for which they had no further need. The gate was in 3 parts. A central roadway 13 feet wide [1] with a raised passage or corridor for foot passengers [2] at each side. The central road sloped upwards either in a series of long slant steps or in one long slope. The whole structure was built of the curious loaf-shaped bricks with an impression of the maker's thumb on top, and which in the lower part were laid in bitumen. Under the central passage and extending even under a small part of the steps was a foundation of large blocks of stone also laid in bitumen. The rarity of this building material and the care with which it is laid shows us at once the importance attached to this entrance. At a later period, but still before the time of Sargon (for the same shape of brick is used, only larger), the level of the gate had to be raised, owing to the accumulation of débris. So another flight of steps [3] was built about halfway along the former passageway. It is at a distinct angle with the lower corridor, but apparently

built as a continuation of it. The location of the gate with respect to the wall is shown at 3, Fig. 12.

In the mounds to the north of this gate we excavated a considerable portion of the ancient city wall [Fig. 16], embracing mainly 2 of its periods, that of Naram-Sin, 3,750 B.C., and above it Ur-Gur, 3,000 B.C. It has been very wrongly stated as an argument against the date assigned to Naram-Sin that his work as well as his father's lie immediately superimposed on that of Ur-Gur. As a matter of fact they never have been found so. In the Temple area his pavement is 8 feet below the top of Ur-Gur's pavement; here again in the city wall we find his wall below Ur-Gur's, and evidently so old and worn that Ur-Gur evidently did not think it worth following, but used it in part as a foundation for his own wall, and removing it elsewhere have the same shape or follow the same direction.

Of Naram-Sin's wall [1,1] we have some hundred feet still traceable, together with one of the water conduits used to drain its surface [Fig. 13]. This was made of his splendidly baked bricks laid in bitumen. Heavy return angles were used to make the wall defensible and obtain an effective discharge of missiles upon the enemy. Quantities of the clay balls for slings and a few arrow heads were discovered along the base of the wall.

The wall was entirely rebuilt by Ur-Gur [2,2] who made it more ornamental than his predecessors by decorating its outer face with panels averaging 11 feet in width and placed 30 feet apart. In all we found 17 of them in the piece of wall uncovered and an additional one can be restored at a point where the wall was destroyed. The inner face was badly cut up and worn, and it was hard to determine the exact thickness of it. At one point, however, we managed to find it well enough preserved to obtain 25½ feet as its thickness. Of Naram-Sin's wall we could find no inner face, it being so badly broken by age and the ruthlessness of successive monarchs.

A series of small rooms occupied the inner face of parts of the later wall, and many interesting objects came from them, of which we cannot give an account in this survey of architectural features.

It is difficult for those who have never seen the uncovering of an ancient city to understand how it happens that there are so many different strata one above the other. The question is often asked what is meant by there being 19 cities one above the other at Nippur and how such a thing is possible. A few simple diagrams will make the process clear. Let us first remember that Nippur is situated in the midst of a perfectly flat country, and although now there are the mounds indicating where the various cities were located, these are the result of man's building operations and not natural to the country.

When the country was thus level let us suppose people, for reasons which do not concern us, chose the spot where Nippur now lies for a dwelling-place [Fig. 14]. Their houses were built upon the ground or perhaps on a slight pavement of brick. War, pestilence or other causes drove them away for a time. All the walls in that primitive period being of mud laid up en masse, the lack of care would soon cause the walls to crumble under the effect of the weather. In a comparatively short time the roof would fall into the house and the upper parts of the walls would fall partly outside and partly inside the rooms burying any pottery or objects of the period which may have been left by the departing owner. Even with the house thus ruined it will be apparent that the débris of the crumbled walls would preserve against further damage the various objects as well as the pavement at

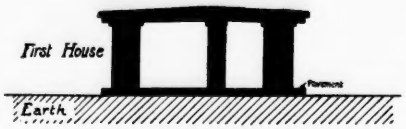



FIGURE 14

FIGURE 15

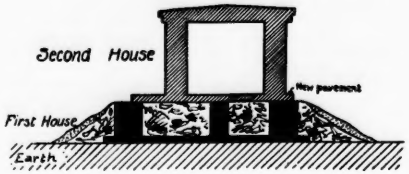
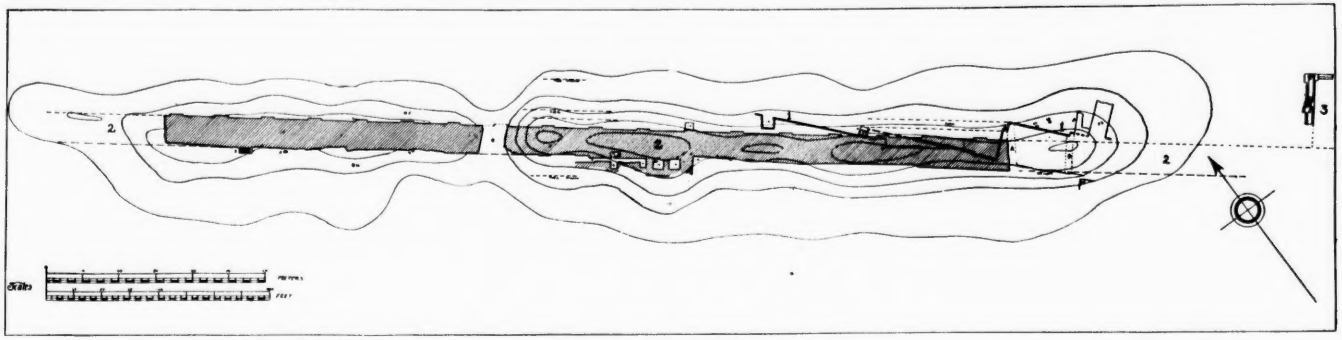



FIGURE 16

DIAGRAMS SHOWING SUPERPOSING OF BUILDINGS OF DIFFERENT PERIODS [SEE PP. 116, 117]



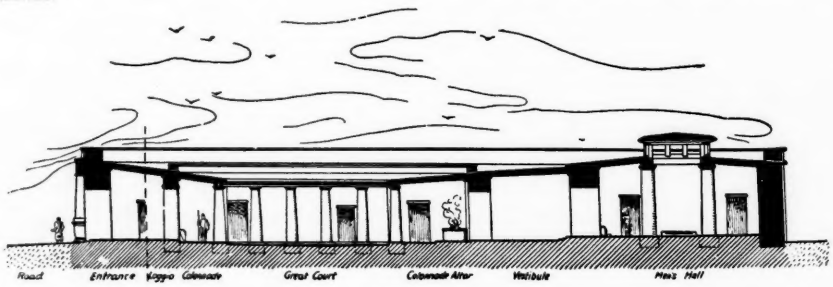

PART OF N.E. CITY WALL [FIG. 12*]

the bottom of the heap. Our primitive house will now present somewhat the appearance of Fig. 15. The wind and rain round off the edges and fill up the crevices until all semblance of a house is lost. Years may pass and again someone looking for a site to build upon lights upon this little mound. The plain is often swampy in the spring and the hill will raise him above its inconveniences. Besides it will make his home more defensible. So he levels off the top, lays a new pavement and proceeds with his house [Fig. 16]. Through the varying periods of time this will go on, after each rebuilding the mound rises higher and becomes more secure against a foe. The destruction of each house leaves a pavement with its accompanying pots and utensils, perhaps jewelry buried with it. In the case of large settlements like Nippur the work goes on even while the place is inhabited. The mud washed down from the walls, the refuse from the houses themselves, all accumulate in the streets and in odd corners. If it had been carried outside the city limits, it would in time have surrounded the place like a wall and made it worse than if the débris had remained. So they left it where it was.

In the Temple, the same is true. The courtyard gradually filled up and when a new monarch chose to restore the holy spot, he had perforce to lay his new walls and pavements upon the remains which he found. Often he would use the old material over again or use parts of walls for his newer ones, but in every case a slight difference would result between the level of his work and that of previous kings. In the later times the advantage of being elevated was so thoroughly recognized that in the erection of great palaces a huge artificial mound or platform was first made upon which the buildings were afterwards laid out.

The way in which the mound has been built up shows how necessary it is to excavate it by a system in which this process is reversed, removing the topmost layer with all the antiquities which determine its period, then taking the next, and so on. Once lay bare by perpendicular cuttings a series of strata such as we have at Nippur, with their periods overlapping and mixed up, and we find ourselves in the midst of a puzzle which can perhaps only be solved by finding similar strata in another portion of the mound.

EDITORIAL NOTE: The above article has been written at our request by Mr. Fisher, the Architect of the Babylonian Expedition, to give a general idea of some of the chief architectural features thus far revealed by the excavations at Nippur. The Babylonian Expedition of the University of Pennsylvania will shortly publish a volume dealing more fully with the subject. Illustrations marked with an * are taken from Hilprecht's *Explorations in Bible Lands.*




SECTION THROUGH THE SMALL PARTHIAN PALACE ON WEST SIDE OF THE CHEBAR, LOOKING N.E.

# THE AGE OF THE LANSING SKELETON

BY PROF. GEORGE FREDERICK WRIGHT, D.D., LL.D., F.G.S.A.

SINCE the publication of Mr. Warren Upham's paper upon *The Fossil Man of Lansing, Kansas* [see RECORDS OF THE PAST for September, 1902], a great amount of attention has been given to the subject by the leading anthropologists and geologists of the world. At the international meeting of Americanists at New York last autumn, the skull was presented, and became one of the principal objects of investigation and discussion by the distinguished savants there present. Among them there was a pretty general objection to assigning an extreme antiquity to the skull on account of its resemblance in shape and capacity to the skulls of some modern Indian tribes.

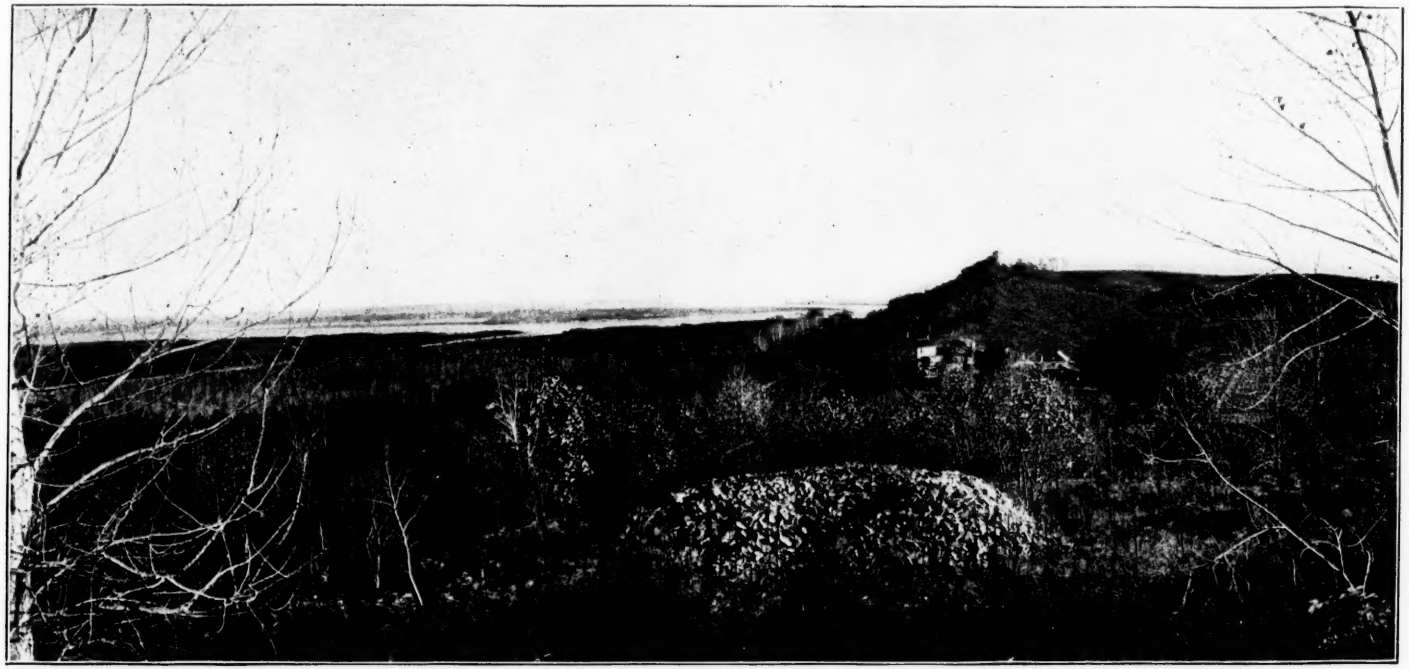
But the inconclusiveness of such considerations is evident upon a little reflection. The anthropologists have no facts upon which to base estimates concerning the rate at which changes may take place in the progressive development of a species. In the case of man, it is certain that the skulls from Egyptian tombs which are several thousand years old do not differ materially from those of the modern Fellahin; while, even upon Mr. Upham's calculation, the Lansing skeleton is not twice as old as some of these Egyptian skeletons. The inferences of the anthropologists are based upon a theory of evolution which is but imperfectly understood, and hence cannot be used to discredit facts established by positive testimony. We are therefore brought without prejudice to consider more carefully the geological evidence of the age of the deposit in which the skeleton was found.

Among the geologists who have visited the site since Mr. Upham's report are Profs. T. C. Chamberlin, R. D. Salisbury, Samuel Calvin and the Author. Profs. Chamberlin and Winchell have also each of them made a second visit to the locality to obtain supplementary information.

Professor Chamberlin's report, occupying 30 pages, appeared in the November number of the *American Journal of Geology*, and is approved by Professors Calvin and Salisbury. In his opinion the deposit is not strictly of glacial age, but belongs to a subsequent period, when the Mississippi River was flowing at a higher level than now, and redeposited a portion of the loess along its margin at that higher level, which, in his opinion, would give to the relic "a very respectable antiquity, but much short of the close of the glacial invasion."

On the other hand, Professor Winchell, after paying a second visit to the locality with Professor Chamberlin's report in hand, made the age of the Lansing skeleton the subject of his presidential address to the Geological Society of America, at its meeting in Washington, on the first of January, 1903, in which he defended the soundness of Mr. Upham's interpretation, and supported it by what seemed to be most conclusive arguments and observations.

According to Professor Chamberlin's view, when the Iowan stage of the Glacial period, during which the main deposits of the loess took place,



PANORAMIC VIEW SHOWING MR. CONCANNON'S HOUSE AND THE RELATION OF THE BLUFF TO THE PRESENT FLOOD PLAIN OF THE MISSOURI RIVER. THE WINDING COURSE OF THE RIVER SEEN IN THE DISTANCE INDICATES THAT IT HAS CEASED LOWERING ITS BED. THE PHOTOGRAPH WAS MADE BY THE EDITOR OF "RECORDS OF THE PAST" FROM THE CORRESPONDING OPPOSITE BLUFF LOOKING ACROSS THE SIDE VALLEY TO THE CONCANNON HOUSE

VIEW SHOWING ENTRANCE TO TUNNEL IN WHICH THE SKELETON WAS FOUND

VIEW SHOWING ENTRANCE TO THE INTERSECTING TUNNEL EXCAVATED BY PROF. WILLIAM HENRY HOLMES, DIRECTOR OF THE BUREAU OF ETHNOLOGY

FRONT AND SIDE VIEWS OF THE SKULL AND FEMUR BONES

came to a close, the channel of the Missouri River, which is here 2 or 3 miles wide between the rocky bluffs, was filled up to an indefinite height, so that the river flowed at a level which was considerably above that which it occupies at the present time. When that level was from 15 to 25 feet higher than now, he supposes that a portion of the loess of the bordering upland was worked over and redeposited on the margin at the level of the Concannon farm, where the skeleton was found. His theory is that subsequently the river has been gradually lowering its bed across the whole channel 2 miles in width, until now the high-water mark falls 20 or 30 feet below that during which the portion in question was redeposited.

On the other hand, the theory of Mr. Upham represents with good reason that the channel of the Missouri at this point has not been undergoing a process of excavation since the Iowan period, but rather of filling. In his view it is not necessary to suppose that the main channel of the Missouri was filled with sediment, while the deposit of loess was going on near the margin or for an indefinite distance backward from the border of the valley. It seems more probable that the motion of water in the main channel would be sufficient all the time to carry forward the fine sediment which it held in suspension, but which would be readily deposited wherever, in times of flood, it overflowed the banks and formed lake-like expanses.

Furthermore, while during the Iowan period the glacial sediment was chiefly loess (which is readily held in suspension in slowly moving water, and so would not fill up the main channel of motion), the subsequent portions of the glacial period were characterized by a great amount of coarse sediment, occasioned probably by a rise of the land to the north, which increased the gradient of the stream. This coarse sediment still forms extensive terraces of gravel in the upper Missouri and its tributaries from the glacial region. But in the valley of the Sioux, 200 miles farther up, they are only 10 feet above the present flood-plain, though a mile or more in width. Corresponding terraces of coarse gravel appear in the Missouri below Sioux City, but gradually diminish in height until, before reaching the mouth of the Platte, they have disappeared below the present flood-plain. This indicates a period of later accumulation of sediment in the channel below the Platte, instead of continuous erosion, as Professor Chamberlin supposes. This view is furthermore corroborated by the fact that the rock bottom of the river at Omaha, and lower down, is about 70 feet below the present bottom. Thus one theory is made to counteract the other, and leave the mind in partial suspense.

Professor Winchell, however, in his presidential addresses, presented more specific facts which are not so easily answered. As described by Mr. Upham, the Lansing skeleton was "imbedded in the upper foot of a stony and earthy *débris* that appears to have fallen from a closely adjacent outcrop of carboniferous limestone." "Above this *débris*, which has an average thickness of about 2½ feet, the upper ⅔ of the tunnel consists of the loess, which also reaches up to the surface, 20 feet above where the skeleton lay." Professor Winchell's more accurate observations show that the lower 3 feet of *débris* beneath which the skeleton was enveloped is independent of the loess deposit above, and, therefore, of course, older. It consists of "residual" sediment which had accumulated previous to the era of the overlying loess, and which differs from that in being entirely free from any lime ingredients. It had been leached of its lime before the accumulation

of loess above it, which is throughout liberally charged with lime. Moreover, according to Professor Winchell, this lower stratum of *débris* with which the skeleton was enveloped, had been an exposed surface, which, when subjected to alternate periods of wetting and drying, had cracked open from the top in numerous places, and permitted the loess to go down in these cracks, where it still remains with its characteristic proportion of lime. This would seem to be an absolute demonstration that the skeleton was enveloped in its present covering during a period preceding that of the entire loess deposit, for certainly, even according to Professor Chamberlin's view, there would have been no opportunity for such a residual accumulation to have taken place in the interval between the time of the general loess deposit and that of his supposed redeposition at a later period.

In light of all these observations, the order of events in the Missouri Valley at Lansing may with reasonable confidence be stated about as follows:

1. In preglacial times there was, over the northern part of the United States, a general continental elevation of indefinite extent which cannot be well measured in the Missouri Valley. But during this period of elevation the main streams and their tributaries everywhere deepened their channels to a great extent. This is evident all over the region, and appears in the Missouri Valley in the fact already stated that the rock bottom of the Missouri River at Omaha is 70 feet below the present bottom of the river.

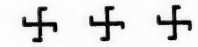
2. In connection with this continental elevation, and perhaps as an effect of it, glacial ice accumulated at the north and flowed southward as far as Kansas City, 20 miles or more beyond Lansing. This is called the Kansan epoch in the Glacial period. The earthy *débris* brought along by the ice-movement over this southern margin was, however, comparatively small in amount; so that when the ice melted off only a thin blanket of transported material was left upon the surface. But Northern boulders, especially those of Sioux Falls Quartzite, are found in considerable abundance scattered over all the highlands of the region.

3. The close of the Kansan epoch was marked by a subsidence of the land considerably below its present level, especially at the north, where it was of increasing extent. Omitting minor stages, the extreme depression of land to the north occurred when the ice front ran across the State of Iowa from east to west not far from the line connecting Omaha with Des Moines and Iowa City. This depression at the close of the Iowan period so diminished the gradient of the rivers flowing to the south, especially of the Missouri, that the current was checked, and became very sluggish, at the same time that the supply of water from the melting ice was enormous. It was, as I interpret it, in the rising stages of these floods that the Lansing skeleton, which was already enveloped in the residuary clay upon its rock shelf, was buried beneath the sediment, or loess, which accumulated with great rapidity all along the margin of the Missouri River. Owing to the sluggishness of this current and the immense supply of water, the Missouri Valley was filled up with water, so as to present a lake-like expanse covering the bluff on either side during a portion of each year, that is during July, August and September, when the melting of the Northern ice was going forward with greatest rapidity. But, meanwhile, during even these flood stages, a considerable current existed in the main channel of the valley, so as to keep it clear of sedimentary accumulations.

4. This Iowan stage of low gradient to the rivers, and so of excessive accumulation of both water and sediment, was followed by the Wisconsin epoch, which was one of increased elevation at the north. It was during this stage that the remarkable moraines were formed which cross Wisconsin, Minnesota and Dakota, and extend southward far into Iowa. At the same time the streams, with their increased gradient, brought down a great amount of coarse gravel and filled the channels, as we have seen, to a considerable height, which have been since partially re-excavated by the streams, leaving the gravel terraces on the sides of the streams, such as I have already referred to on the Sioux River. But the axis of this northern elevation of the later period was a considerable distance above Lansing; so that the process at Lansing since the Iowan period has not been one of excavation, but of continuous filling of the channel by the coarser material which is constantly being brought down from the elevated area of Wisconsin glaciation. But the high-water mark is still much below the Lansing horizon.

This gives a consistent explanation of all the facts, and enables me with reasonable confidence to affirm that the Lansing skeleton was buried before the close of the Iowan epoch of the Glacial period, which, on Mr. Upham's calculation, must be as much as 12,000 years ago.

But, while the glacial age of this skeleton may, therefore, be confidently accepted, it should be kept constantly in mind, for the relief of the anthropologist, that there is increasing evidence that the closing stages of the Glacial period in North America did not long precede that of the high stages of civilization brought to light by recent explorations in Babylonia. Hilprecht and others would carry that date back to 9,000 or 10,000 years, which would be within 3,000 years of the date assigned by Mr. Upham to the deposition of the Iowan loess.

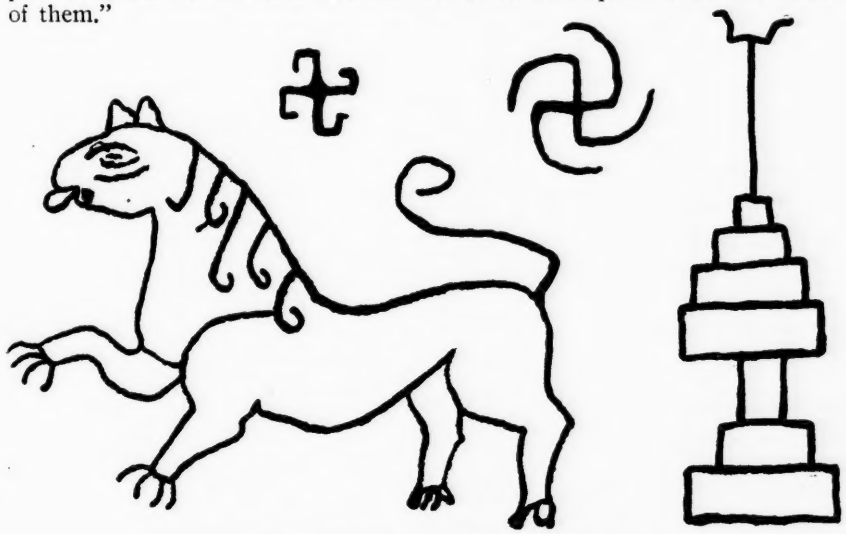


# EDITORIAL NOTES

**GILGAMES, THE HERO OF THE FLOOD:** At a recent meeting of the Society of Biblical Archæology Dr. Pinches read a paper on *Gilgames and the Hero of the Flood: The New Version,* in which he described the fragment of a Babylonian tablet purchased by Dr. Meissner at Bagdad for the Museum of Antiquities at Berlin, and published by him in the *Mittheilungen der Vorderasiatischen Gesellschaft.* It gives a part of a different version of the story of Gilgames from that first translated by the late George Smith, and as it is inscribed in the style of about 2,000 B.C., when the legend had taken the form in which we now know it, the date may be regarded as fixed. The new text as preserved to us, consists of the lower part of the first and second columns, and the upper part of the third and fourth. The incidents to which it refers are a conversation between Gilgames and the Sun-god, who asks him why he wanders about; his answer to the goddess called Sabitu, in which he laments the loss of his friend Eadu (Ea-bani), and receives a somewhat unsatisfactory rejoinder; and finally his meeting with Sur-Sunabu, the boatman of the Babylonian Noah (here apparently called Uta-naistim). A short comparison of the version of Mr. George Smith with the present

text was then made, and the parallels pointed out, after which the forms of the names Gilgames, Ea-du, Sur-Sunabu, and Uta-naistim for Ut-naistim were briefly discussed. Dr. Meissner has rendered a service to Assyriology in publishing this important variant of the legend of Gilgames.

**ROCK CARVINGS FROM LADAKHI:** Rev. A. H. Francke in an article in the *Indian Antiquary* pictures a large number of rock-carvings collected by himself in the Western districts of the ancient Ladakhi Kingdom. As regards the age of these carvings he says, "It is difficult to say anything definite at the present time. Some of them may have been executed only recently; for the art of carving on the rock is still practiced, as can be seen from various carved Buddhist formulæ and emblems, the artists of which are often well-known people. But what makes for the very ancient character of the art as a whole and of certain carvings in particular, is the frequent occurrence of representations of stupas, entirely different in form from those existing at the present day. The state of the carvings does not in the least enable us to fix their respective ages, as they are all in wonderfully good preservation. Along the banks of the Indus are many boulders of highly polished granite. These are all overlaid by a thin glazed encrustation of a dark brown color, which protects the rock against the influence of the air. It is by removing this that the inscribed carvings are produced, and all that time could do would be to deepen the lines of some of them."



SPECIMENS OF ROCK CARVINGS FROM LADAKHI

A few of these sketches we reproduce. That of the lion with the curled mane is probably the white lioness with turquoise locks which is the personification of the glacier. All the animals represented in these drawings are very rude, but have an element of attractiveness about them, for none of them are stiff with the exception of a few purely conventional forms. Mr. Francke thinks that the carving of the lioness "Goes back apparently to a model spread all over the East and Far East, possibly as a degeneration of the lofty and very ancient art of Assyria."

The swastika cross in the accompanying drawing is very interesting as it is exactly the reverse of the original swastika cross so common in ancient art all over the world. The usual form showing a turn of the arms of the right, while these turn to the left. The one with semi-circular arms being apparently a modification of the one with right-angled arms.

**EXCAVATIONS IN ROME:** Signor Boni, director of the Government's excavations in Rome, has written a most interesting article for *Harper's Magazine* for March [1903] on the recent excavations in the Roman Forum which is of special value in that it has thrown much light on the inner nature of the ancient Romans. One of the most interesting discoveries is that of the "concrete base of the altar in the front hemicycle Heroon." This Heroon was an edifice built by Augustus on the spot where the body of Cæsar was cremated. That the Heroon is the correct site is shown by the inscription found on the lintel—*Divo Julio.*

He also found that the Vulcanal Rock, the work of the primitive Latin folk and possibly the oldest monument of the Aryan world, which "still stands as it was hewn with axes and covered with red rust plaster," was used as a foundation for the new Rostra of Cæsar's time. On this Rostra were nailed "the head and hands of Cicero as symbols of vendetta achieved." This is the only trace of Julius Cæsar's own work which has yet been found on the surface of the Roman Forum.

Beneath the center of the Forum were found traces of apparatus for "stage-carpentry and scene-shifting in the gladiatorial games," given by Cæsar for the benefit of the populace before the amphitheater was constructed. There were also discovered a number of ritual pits belonging to this same period. The "Cæsarean" pits are oriented differently from the Republican pits of an earlier age. Those of Cæsar are shifted 30° toward the South from the original axis of the Forum which corresponds with the shifting of the Forum axis made by Cæsar.

In these ritual pits were found ashes of oak which was the "sacred tree of the Aryans." It seems that these ashes "were deemed to contain strength for the nutrition of other oaks which, in an unbroken cycle transformation, would in their turn nourish the Sacred Fire" of Vesta.

Among the ashes of a sacred oven which was abandoned about 400 A.D., when the last vestal was driven out by Serena, was found a *liba* of charred paste representing a raft that was sacrificed to Janus. In this house of the vestals were identified the "*penetralia* or Holy of Holies," where were guarded the "documents of *Fides Publica*, the supreme testamentary institutions and the dispositions for divine arbitration by ordeal of fire and water."

The Springs of Juturina were found choked up with fragments of marble Greek statuary dating about the V Century B.C., "representing Castor and Pollux with their horses standing to guard the two Springs, one on the East, the other on the West." The desecration of this group of statuary is probably the work of later Christians.

Near these springs was a shrine of later date and yet of considerable interest—"the Basilica Palatina, containing the early Christian church, known as Santa Maria Antiqua." This consists of a hall 32 m. long, at one time vaulted, and "*atrium*, and an *impluvium* with 3 compartments which were converted into a Christian church about the beginning of the VI Century." On one of these walls were found traces of 4 paintings

superposed on one another and dates from the earlier part of the Middle Ages. This church remained in use until the IX Century, when it was abandoned and the church of Santa Maria Nova was built on the site of the Temple of Venus near the upper Sacred Way.

Signor Boni has now begun the excavation of one of the walls of the Temple of Jupiter Sator which is supposed to have been built by Romulus in fulfillment of a vow to Jupiter made when he besought the god to enable him to hold his ground against the Sabines.

Signor Boni thinks that it will be possible in time to restore the entrance to the Palatine, so that "visitors descending from its height into the Forum may pass from the monuments of the earliest centuries of Roman life" to the frescos adorning the walls of the mediæval Christian church of Santa Maria Antiqua.

Professor Lanciani in the *Athenæum* mentions the following interesting finds:—

Among the Roman historical inscriptions which have been broken, mutilated, dispersed all over the city, none has met with a more remarkable fate than one describing the life and exploits of Avilius Teres, the celebrated jockey of the time of Domitian, It was first removed from its original site by an unknown patrician at the end of the III Century, whose epitaph was engraved on the back of the slab. Secondly, a Christian named Aurelius Romanus made use of it for his own grave and that of his sisters. When the church of Santa Maria Transpontina was first built in the VIII Century, near the Castle of St. Angelo, part of the slab was made use of in laying the marble pavement. The church was demolished in July, 1564, by Pius IV, to make room for the new fortifications of the castle, and when Pope Urban VIII built in 1627 the pentagonal bastions, two fragments of the inscription came to light, one of which was lost, the other being removed to Florence, where it is still to be seen in the Galleria degli Uffizi. In the course of a general restoration of the castle with a view of transforming it into a museum of Artillery, many other fragments were found a few weeks ago, of which Urban VIII had evidently made use in his own structures. Putting together all these pieces we have about ½ of the whole text, which was divided into 3 sections. The first contained the summary of the exploits of the valiant rider, the number of races won, and his gains of honors and money. The second gives the names of the horses which were led by him to victory, the majority of which are Africans, one Gaulish, one Arab, one Spanish, and two Laconian. The last section describes all the innovations brought out by Avilius Teres in racing, in harnessing the horses to the chariot (for instance, *interpositis equis paribus*), or in driving the chariot itself (for instance, *intra funes primum vicit*); also the names of the celebrated riders defeated by him, such as Claudius Olympus, of the faction of the 'greens,' Communis and Epaphroditus, whose colors are not specified. The last two must have been of remarkable prowess, because even Diocles himself, the prince of the Roman jockeys, boasts of having defeated them in more than one match. The inscription, however, omits one essential fact—that Teres was defeated in his turn by Diocles after he had come out the winner in 1,011 matches.

The finding of so many records of this class of people in the district of the Vatican shows that they had selected the burial-fields of the Via Cornelia or of the Via Triumphlis for the erection of their showy Memorials. This partiality for the Campus Vaticanus may have originated from the fact that here Volucris, the wonderful racer from the stables of the greens, and a great favorite with the Emperor Lucius Verus, had received honors of bronze statue and a showy tomb.

In a cutting made across the Piazza Colonna to improve the level system of drains the pavement of the Via Flaminia has been discovered, at a depth of 21 feet under the level of the Corso, as well as the pavement of the square surrounding

the Column of Marcus Aurelius. The lead water-pipe was found under the paving-stones at the corner of the Chigi Palace, upon which the following legend is engraved: 'This pipe has been laid under the care of Phœbianus, commander of the first division of policemen and firemen' (*'sub cura Phœbiani tribuni cohortis primæ vigilum'*). The legend has been interpreted in the last number of the *Bullettino Archeologico Cumunale*, p. 193, in this sense: that Commander Phœbianus had obtained a grant of water for the supply of the barracks in which his men were quartered—the Scotland Yard of ancient Rome—which covered in Imperial times the space now occupied by the convent of San Marcello and by the Plazzo Muti-Savorelli. The interpretation cannot be accepted, because the distance between the spot where the pipe has come to light and the site of the barracks is too great, and because if the *vigiles* of the first division were in need of water they would certainly have obtained it from the aqueduct of the Aqua Virgo, which runs close to the barracks. My own explanation is that the city of Rome was furnished with hydrants for the use of the fire brigade, in which case the care of laying the network of pipes would naturally have fallen to the share either of the commander-in-chief (*praefectus vigilum*) or commander of each of the 7 police districts. This supposition is strengthened by the fact that another pipe, marked with the words 'laid under the care of Tiberius Claudius Juventinus, captain of the first cohort *vigilum*,' was found at the same time at the east end of the City. It belongs evidently to the same general system devised by the authorities to lessen the danger of fire.

**ANCIENT TOWNS ON THE SHORES OF LOB-NOR:** A faint idea of the important ancient history of the western part of the Desert of Gobi and Central Asia is obtained from the preliminary report which Dr. Sven Hedin recently presented in a paper before the Royal Geographical Society of England. On the shores of the Lob-nor he found the ruins of several towns which are now in an absolutely uninhabitable section. These show that there have been great climatic changes in this part of the country, through which at one time a great caravan route crossed the Desert of Gobi passing along the north shore of Lob-nor. This route is marked by the remains of numerous brick signal or watch towers, one of which still measures 29½ feet in height. In the houses were found wood carvings, Chinese coins bearing dates from 118 B.C. to 581 A.D., axes, sacrificial cups and carvings. Among the latter was one scene showing a "tiger, yak and antelope hunt," in which the hunters were using crossbows. In another village of 19 houses he found a lamp, Chinese money, the wheel of a Turkestan cart and some pottery. This village contained a Buddhist shrine in which was an image of Buddha and also a small piece of wood covered with native hieroglyphics which have not as yet been deciphered. This shrine looks out to the South across the reed beds of Lob-nor, but is protected on the North by poplar woods which have been desiccating for centuries until they are as brittle as glass. The most important discovery, however, was a pile of papers and letters found in one of the houses beneath 2 feet of sand. These were covered, on both sides, with Chinese characters, part of which have been deciphered by Mr. Himly, who places their age at between the middle of the III and the beginning of the IV Century A.D. These manuscripts show that there was a large and prosperous community on the shores of Lob-nor, one document referring to a war in which the local commander had 40 officials under him. Most of the manuscripts, however, deal with the agricultural transactions of an important merchant. There is a record of a "grain bank" where grain was bought, stored or received as security for loans.